Outside In

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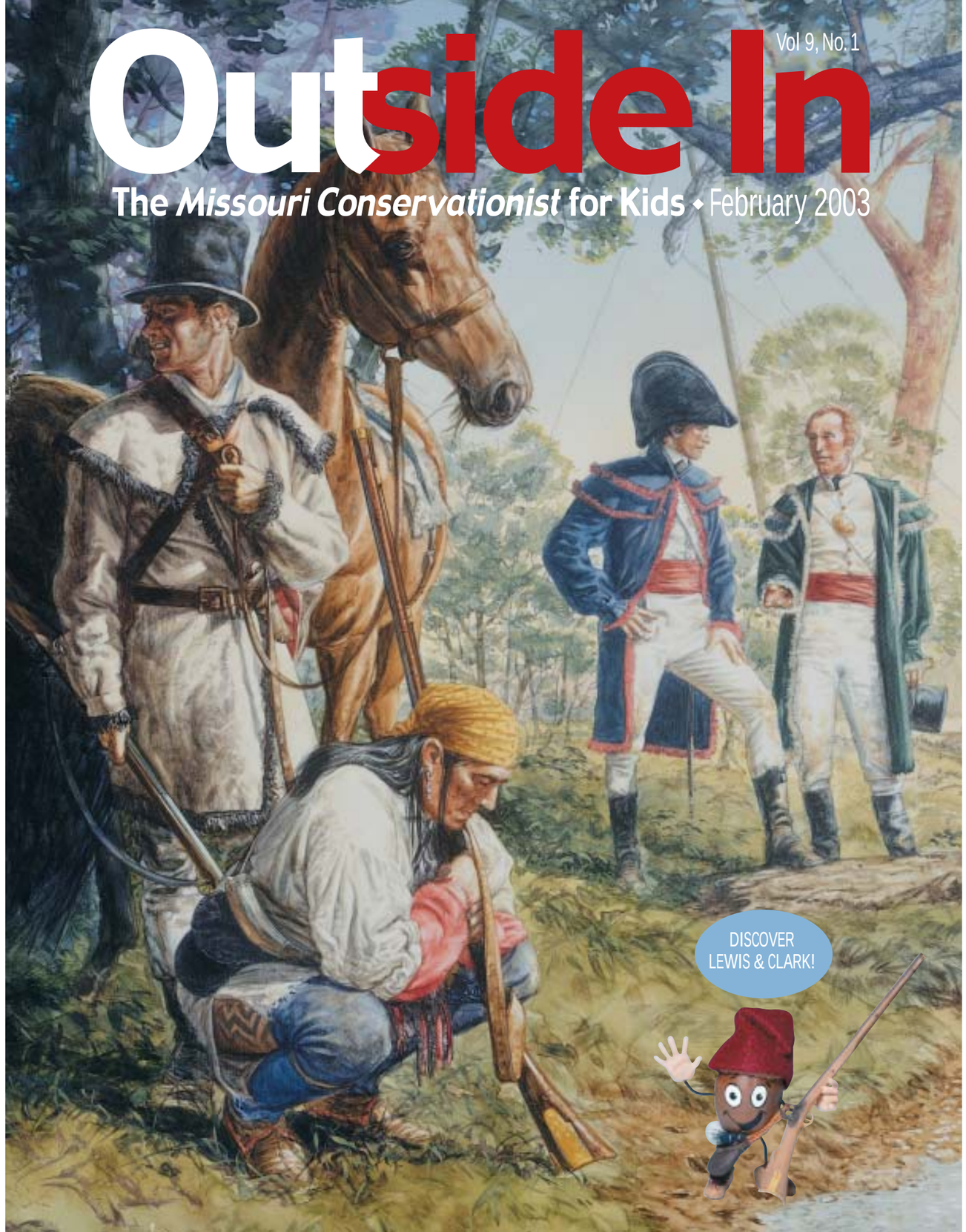


The River Before Time

by Jim H. Wilson

the Missouri River provided an avenue into the new frontier.

The Missouri River has been flowing for thousands of years. It starts as a mere trickle high in the Rocky Mountains and flows out across the high plains and right down the middle of what we now call Missouri. For many years, the river meandered between ancient bluffs. It cut through prairies. It dug new channels. Sometimes the channels separated and then came back together.

The river has always drawn people to its banks. Native Americans often camped or lived along the river or the small streams that flowed into it. They hunted, fished, trapped and traveled along the river.

The land from the Rocky Mountains to the green, wooded hills and valleys near the Mississippi River was said to be part of the "New World." Because it didn't appear to be owned or controlled by anyone, early explorers from France claimed it for their home country and named it all "Louisiana," in honor of the French King Louis XIV. In 1762, France gave to their rights to the land toSpain. The western part of what is now the United States was under Spanish control for the next 40 years.

In 1803, President Thomas Jefferson ordered an exploration of the Missouri River to determine whether it was the best way to travel west to the Pacific Ocean.

Chronometer Photo Courtesy of Missouri Historical Society; Portrait Courtesy of Independence National Historical Park; Michael Haynes Illustration

Lewis' telescope helped him spot game and look at the stars.

About 200 years ago, French Emperor Napoleon Bonaparte forced Spain to give the territory back to France. Thomas Jefferson, President of the United States of America, arranged to buy the land from France. The Louisiana Purchase was so big that it doubled the size of the United States. It also allowed the young nation to expand its borders to the Pacific Ocean. Before the Louisiana Purchase, the Mississippi River was our western border.

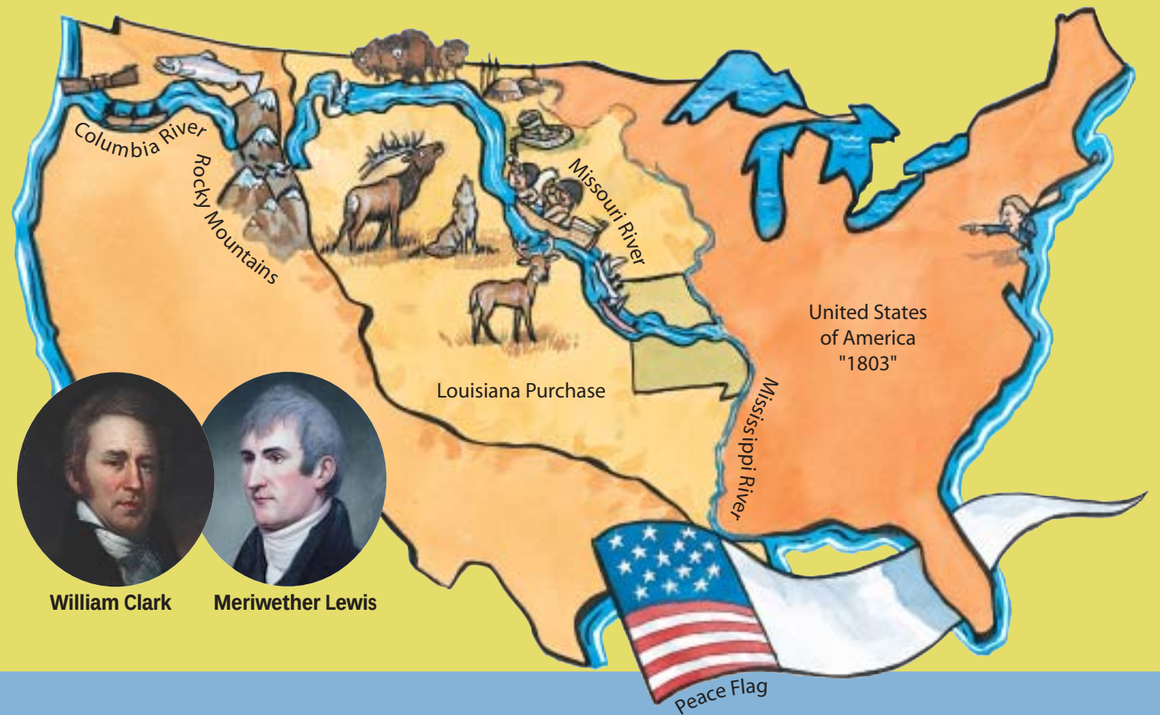
There were stories and even books about the new land, but no one really knew for sure what was there. Some people claimed that giant wooly mastodons, 7-foot tall beavers and, even, unicorns lived there.

Maps were no better. The whole middle of the map of the Louisiana Purchase was mostly just blank white space. Of course, there were no roads or cities. The whole area was unexplored.

President Jefferson had a vision that the vast region would someday be filled with small farms. He knew that the Missouri River was the main avenue to the middle of the country.

In 1803, President Jefferson sent two army officers, Meriwether Lewis and William Clark, to lead an expedition into this new land. They were to explore the Missouri River and the major streams that connected with it. Specifically, they were to look for the fabled "Northwest Passage," a water route that supposedly led to the western coast of North America.

Along the way, Lewis and Clark were to make detailed observations of the region's geography, mineral resources, soils and plant and animal life. They were to collect scientific specimens, attempt to observe and establish friendships with the native people and identify possible trading opportunities.



William Clark

Meriwether Lewis

Lewis and Clark, along with Seaman, Lewis' dog, stand on a high bluff to survey the Missouri River.

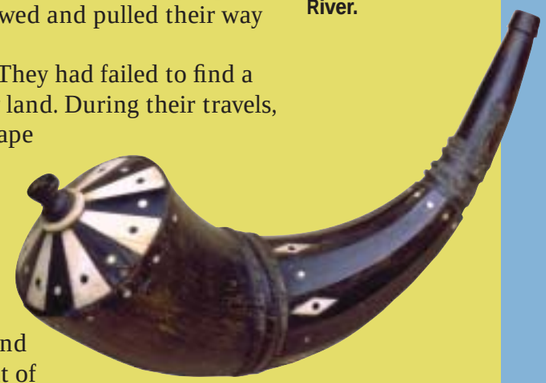
The explorers carefully selected about 30 hardy men for the adventure. The group was referred to as the "Corps of Discovery." Seaman, a large Newfoundland retriever dog which belonged to Captain Lewis, accompanied the group all the way to the Pacific Ocean and back.

Captains Lewis and Clark collected everything they thought they would need for this trip. Their gear weighed many tons. Many of the items were gifts for the native people they would meet on their two-year trip. In 1804, they sailed, rowed and pulled their way up the Missouri River, into the heart of the region.

The Corps of Discovery returned more than two years later. They had failed to find a water route to the western ocean, but they had explored a new land. During their travels, they described and named hundreds of geographic and landscape features, and they documented the native people that lived throughout the region.

Although the expedition never encountered mastodons or unicorns, they did find 122 species or subspecies of animals that had been unknown to science. They also found 178 plant species that had never been recorded.

The courage and dedication of Lewis and Clark and their band of explorers infused our young and growing nation with a spirit of adventure and discovery. Their exploits continue to inspire us today, 200 years after America's Corps of Discovery.



Clark kept his gunpowder dry in this powder horn.

Portraits Courtesy of Independence National Historical Park; Artifacts Courtesy of Missouri Historical Society; Mark Raithel Illustrations

Traveling on the Wild Missouri River

Early traders and explorers faced great danger at every turn on the Missouri River.

By Martha Daniels

The explorers saw many animals, including black bears, catfish, deer and least terns.

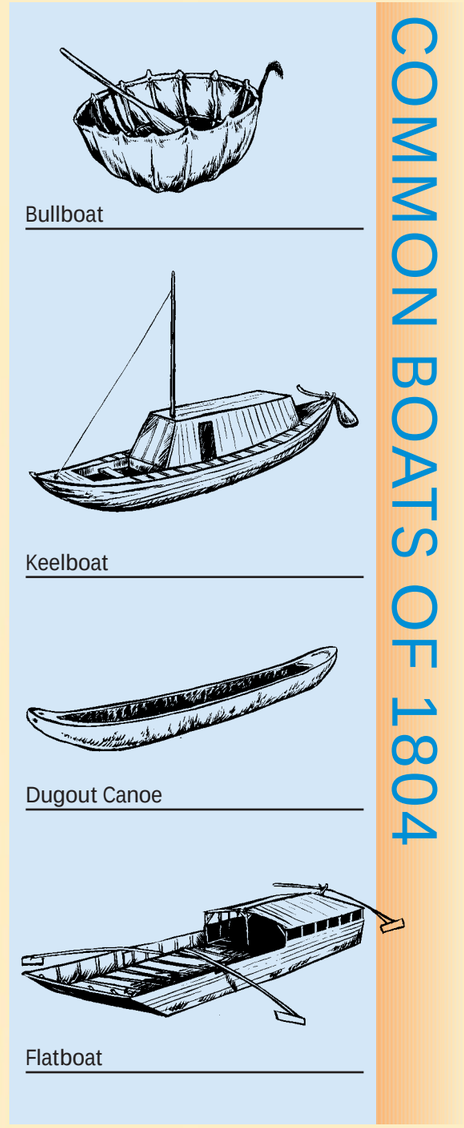
To read explorers' journals, the Missouri River of 200 years ago was a wild and raging beast compared to the river of today. The changes people have made to it over the years have tamed it, so to speak.

Back then, Missouri River water was very muddy. People commonly said that it was "too thick to drink, but too thin to plow."

As Auguste Chouteau and his traders traveled west from St. Louis in 1794, they saw a wide, twisting river. The winding river flowed near wetlands and marshes and shallow backwaters. Many types of habitats made up the river.

THE RIVER ROAD

The current in the channel was about 2 to 3 miles per hour. Travelers reported encountering great wads of trees that the water pushed around to create hazards and rapids. Miles of sandbars and wetlands were along the edges. They filled up during floods, providing resting and nesting places for ducks and geese and places for young fish to grow.



Mark Raithel Illustrations

At the time of the expedition, the Missouri River was wide and full of sandbars and snags.

Cliff White

Some of the boats commonly used on the Missouri River until the 1830s were dugout canoes, bullboats, keelboats and flatboats.

Dugouts were the traditional transportation on the river. Native people and, later, traders and settlers made them by hollowing out logs of cottonwood, soft maple, sycamore or walnut. A dugout usually had a flat bottom and pointed ends and ranged between 20 and 30 feet long, but some were even longer. The boats weighed between 1,000 and 3,000 pounds. A few dugout canoes that were sealed in sand and mud for hundreds of years have been uncovered near streams and rivers.

Keelboats were wooden boats, often 50-60 feet long, with a main deck, a covered cabin on top and an open hold for storage. Keelboats had sails and a large oar to help maneuver them. The current was too strong for the clumsy keelboats to go upstream against the main flow, so they traveled away from the main channel, usually along the bank where the current wasn't as strong.

Flatboats were like barges. These large boats could run in shallow water. They hauled cargoes of furs, trade goods, grains and food supplies.

Jim Rathert

A distant relative of this midland smooth softshell turtle may have seen Lewis and Clark on their expedition.

Bullboats were used mostly to cross rivers in prairie areas, where there were no large trees. People built bullboats by stretching a bison, or buffalo, hide over a willow frame. Plains women often used bullboats to transport meat after a bison hunt.

River Dangers

Going downstream to St. Louis on the Missouri River was a breeze, especially in spring when snows melted, making the river high and swift.

Conservation Department employees have built several dugout canoes like those used in the expedition. The heavy canoes are seaworthy, stable and easy to steer.

Going upstream was a lot harder. They didn't have motors back then. Instead, travelers relied on strong muscles to push a boat with a pole, paddle with oars and pull it with ropes.

Poling the boat was the most common method. Men lined the walkways on each side of the keelboat deck and, together, they "walked" the boat forward with poles pushed into the river bottom.

In places where the river bottom was too deep or soft for poling, the men pulled the boat from the bank with a long towrope. This was called cordelling. It was hard work to wade in sand and mud along the bank all day, pulling on a long rope.

The river was also dangerous. Big submerged logs (called sawyers) could puncture a boat and sink it. Great rafts of trees floated downstream, too. Etienne de Bourgmont in 1714 described seeing an entire bank collapse and turn into what looked like a floating island. Meriwether Lewis and William Clark wrote on July 14, 1804: "The bank is falling in and lined with snags as far as we could see down."

River Explorers

When Lewis and Clark started up the Missouri River in 1804, their biggest concern was how to transport 27 tons of cargo. The explorers had a 55-foot keelboat with 22 oars, nicknamed "the barge." It carried 12 tons of food, supplies and equipment. There were two pirogues (pe-ROGZ), which were large rowboats. The red pirogue was 40 feet long and 12 feet wide with seven oars.

Going upstream, they wrote of running the boats on logs and sand, passing under falling banks, working against swift currents that broke tow ropes and pulling through rapids a mile long. Their boat's sail mast broke close to modern-day Jefferson City, and they reported stopping to make new oars from ash trees. Storms, they wrote, almost swamped all of their boats one night.

Clark was better at river navigation, so he stayed in the boat, while Lewis traveled along the river on horseback.

Cliff White

MAKING A DUGOUT CANOE

To build a dugout canoe, a river traveler found a tall, straight cottonwood or soft maple tree near the riverbank. Cottonwood trees were the main trees used in this region because they were large, grew near the river and were tough enough to withstand the rigors of river travel.

People built dugout canoes with hand tools, including saws, axes or hatchets, adzes, chisels, draw knives and mallets or hammers. An adze is an ax with the blade twisted on its side. They sharpened their tools with files.

After cutting or felling a tree near the water, they removed its bark. They then flattened the straightest side of the log for the canoe bottom. After turning the log over, they shaped the ends so that the canoe could cut through the water.

They used an adze to gouge out the soft inner wood of the log. Sometimes builders hurried the gouging process by making a fire in the log and scraping out the burning wood.

The sides of a boat were usually 2 to 3 inches thick, and its bottom was 4 to 6 inches thick. The thicker bottom kept the boat steady in the water. Some dugouts were made with benches or dividers inside to increase strength. Building a dugout took from two days to two weeks!

The Conservation crew demonstrates boat-building techniques at outdoor festivals and events, using hand tools like this foot adze (right).

Jim Raithert

Today, the Missouri River is narrrower and straighter than when Lewis & Clark traveled it.

Lewis and Clark wrote of the deer, ducks, geese and bears they found on the sandbars and islands. They also wrote about Forster's terns, soft-shelled turtles, blue catfish and channel catfish.

Lewis and Clark arrived back in St. Louis in September 1806 with one pirogue and five dugout canoes. During the trip, the crew made more than 20 dugouts and bought four more from natives. They also used two bullboats. Almost 80 percent of their trip had been by water.

The River Today

The Missouri River today is much different from the one Lewis and Clark traveled. The river is straighter and narrower, and the Corps of Engineers maintains a channel deep enough for barges and large boats.

Nowadays, pulling a boat upstream along the banks and the shallows would be impossible. The banks are steep, and rock walls, called wing dikes, stick out into the river. Paddling upstream in a dugout would be nearly impossible, too, because the current now flows at 5 or 6 miles per hour.

The swift current sweeps silt, sand and logs from the channel. Silt and sand fill in behind the dikes, cutting the river off from its floodplain. When floods come in the spring and fall, the waters don't slow enough to soak into the floodplain or surrounding land. This means we have fewer wetlands, islands and sand bars available for wildlife habitat.

A flood of traders and adventurers headed up the river after Lewis and Clark returned in 1806. By the 1830s, steamboats were traveling up and down the Missouri River loaded with furs, and villages began to dot the river's banks.

Today, barges continue to carry cargo upstream and downstream, but people are using the river more often for boating, fishing, nature study, hunting and camping. It's as if we are rediscovering the wild and historic Misssouri River.

Discovery Quiz

After reading all three articles, see how much you've discovered! Answers are upside-down below.

1. Who was President of the United States in 1803?
2. What is the main flow of the river called?
3. What was the most popular fur animal during the fur trade?
4. What river did Lewis and Clark travel on from St. Louis?
5. What is it called to trade without money?
6. What were furs used to make in Europe?
7. What kind of boat was made from a big log?
8. What kind of wood did this boat use?
9. What kind of tool is like an ax turned sideways?
10. What is it called to pull a keelboat along with a rope?
11. What kind of boat is made from a bison hide?
12. What new kind of fish did Lewis and Clark write about?

1. Thomas Jefferson 2. Channel 3. Beaver 4. Missouri 5. Barter 6. Hats 7. Dugout 8. Cottonwood 9. Adze 10. Cordelle 11. Bullboat 12. Channel and blue catfish

CRAFTING A DUGOUT CANOE

Make your own miniature dugout canoe and learn how they were built.

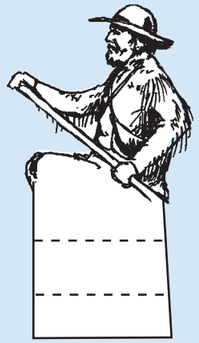
MATERIALS:

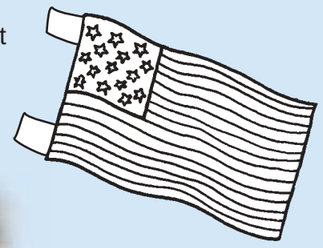
oven-bake polymer clay (white or brown)
dental floss
paperclip
glass baking dish and waxed paper
white paper for covering table
toothpick

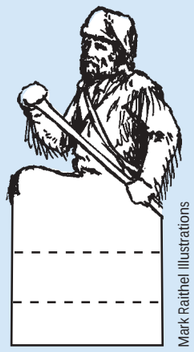
DIRECTIONS:

1. Place paper on table, floor or other work surface. If needed, mix clay colors to form tan or brown by pulling and twisting the clay.
2. Form the clay into a log about 6 inches long and 1 inch thick.
3. Use the dental floss to flatten one side of the log. Roll the log over so the flat side is down. Place log in baking dish lined with waxed paper.
4. Use the dental floss to cut off and flatten the top of the log. Shape the ends using the floss or a table knife.
5. Pull the paperclip apart and bend one of the ends down. Use the paperclip "adze" to dig out the inside of the log. Be careful not to make the sides too thin or they will fold in when baking.
6. Place a toothpick in the back of the boat behind the seat. This is for the flag. Use another toothpick to make a hole in the front for a rope, if you like.
7. Ask an adult to help you bake the canoe according to clay directions (275 degrees for 30 minutes).
8. Allow the boat to cool. You can paint it with water-based acrylic paint. Cut out and color the flag and traders. Tape or glue the flag to the toothpick and set the traders in the boat.

Cliff White







Mark Raithel Illustrations

Cliff White

When your boat is finished, add the fur traders and flag.

Where the Fur Trade Began

The fur trade went through St. Louis, priming Missouri for settlement.

by Martha Daniels

Trappers and traders braved the dangerous wilderness to obtain fur. This trapper strikes steel against flint, causing a spark that will ignite tinder cupped in his hand. He'll use the burning tinder to start a camp fire.

The St. Louis riverfront, where the Gateway Arch stands today, was where the west began in the late 1700s. Traders loaded their boats and canoes with items to trade for fur and traveled up the Missouri River. There were no farms and towns in Missouri yet. This was the edge of the frontier.

The traders returned to St. Louis each spring, their boats piled high with furs. The beautiful beaver furs of this rough country were in high demand in Europe. Traders obtained furs by bartering (trading without money) with the native tribes in Missouri and beyond. European goods, such as wool blankets, beads, jewelry, guns, whiskey, cloth, mirrors, knives, cooking pots and iron tomahawks, were in great demand among the Indians.

The Fur Trade Town

Pierre Laclede founded St. Louis in 1763 as a French post for trading furs. Back then, the region belonged to France. Laclede trusted his 14-year-old stepson, Auguste Chouteau, to oversee building the first St. Louis homes. Soon, Missouri and Osage Tribes visited the new village. Laclede wanted furs to ship to Europe and the Osage wanted the metal tools and decorations they saw.

By 1787, nearly 1,000 people lived in St. Louis, and fur trading was an important part of the economy. In 1794, Chouteau had a monopoly on trade with the Osage tribes. That means he worked out agreements so that only he could trade for Osage furs.

St. Louis soon was the center of the world's fur trade. It grew quickly because it was on the banks of two major rivers, the Mississippi and Missouri. Also, the Illinois and Ohio rivers were nearby for eastern travelers. To the west, hundreds of miles of the Missouri River provided access to wilderness territory that was rich with fur.

Fur trade was hard work. It required men who were strong and brave adventurers. Traders traveled to new regions not knowing what they would find. They encountered dangerous animals, harsh weather and unfriendly Indians, but they also found beautiful prairies, mountains and clear blue streams, as well as tribes eager to trade. The trips were hard, but traders could make lots of money because the demand for fur was very strong.

Hunting pouch and powder horn

Trade rifle replica

Hatchet head

Trade beads

Trade pistol parts

Mark Raithel Illustration; Photos by Cliff White; Artifacts courtesy of Arrow Rock State Historic Site

Cliff White

State Historical Society of Missouri

Indians sometimes traded furs for small bells and cones they used for making jewelry.

Tip Your Hat to the Beaver!

Beavers are difficult to hunt. They live in thick lodges and are excellent swimmers.

The Indians were very good at hunting beaver. They would block the doors to a lodge, then break through the roof to get the animals. Beaver were usually hunted or trapped in the winter, when their fur is thickest.

Beaver fur has a coarse outer hair and a downy soft, shorter hair. When pressed together, it made an excellent felt or fabric. Tall hats made of beaver felt were very fashionable in Europe.

Beaver pelts were usually stretched on willow hoops to dry. The traders then packed the dried furs tight in large presses, wrapped them in deer hides and transported them to warehouses in St. Louis. From there, the pelts were shipped to Europe.

Commerce for the U.S.

President Thomas Jefferson understood how important the fur trade was for the new United States. After the Louisiana Purchase in 1803, President Jefferson wanted to explore the new territories and establish ties with native tribes, so he sent Meriwether Lewis and William Clark into the far west.

The fur trade grew very fast after Lewis and Clark returned in 1806. Boatmen, or voyageurs (vwa-a-JURZ), moved keelboats loaded with tons of trade goods up the rivers.

At the beginning of the fur trade, native tribes welcomed the trade, but as more Europeans and settlers moved into their territory, wildlife began to disappear, and Indians feared for their land.

By 1820, trading gave way to trapping. For the next 30 years, mountain men trapped and sold beaver, mink, otter, skunk, raccoon, fox and badger furs. In 1831, the American Fur Company sent the first steamboat, the *Yellowstone*, up the Missouri River.

Changing Hats

In Europe, beaver hats fell out of fashion as wealthy people began wearing silk hats, and working people preferred wool caps. The fall in demand for beaver had a dramatic effect on the American fur trade. Beaver pelt prices dropped from $5 in 1829 to only 85 cents in 1846. The supply of beaver fur fell, too, because 60 years of overhunting left beaver populations very low.

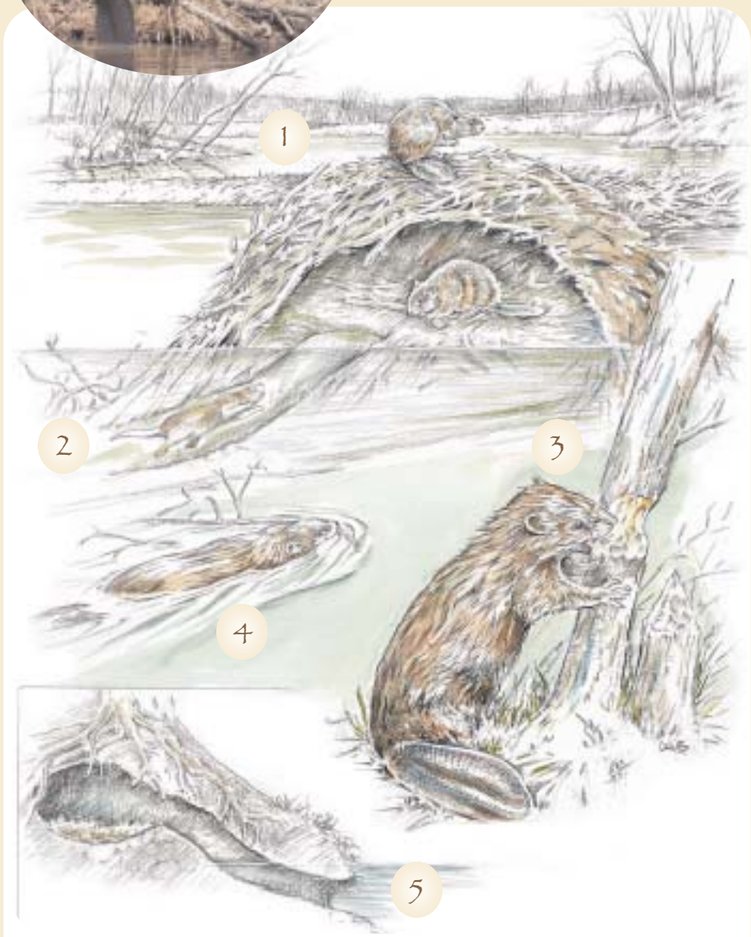
Settlers moved in as the fur industry wound down. Old trading posts soon became towns and cities. Trails became roads. Missouri became a territory and, in 1821, a state. The fur trade had brought people, prosperity and progress to the new frontier.

State Historical Society of Missouri

A boat crew encamps along the Missouri River.

Heather R. Davidson

The Fellow with the Fur



1. Beavers construct dams to make deep-water pools. They then pile up sticks in the pool to make lodges or homes. A lodge may be up to 7 feet high and 40 feet wide.

2. A beaver lodge has an underwater entrance. The floor inside the lodge is above water.

3. Beavers cut down 2- to 8-inch trees by standing on their hind feet and gnawing with their front teeth. They use the trees for food and building materials.

4. A beaver swims with branches in its mouth. It eats the bark and adds the twigs to the lodge or dam.

5. Beavers dig bank dens along rivers where water is too deep or swift for building a lodge. Bank dens also have underwater entrances.

Charles Schwartz Illustrations

The beaver has fascinated

Americans for centuries. People admire its plush coat and its building skills. Beavers can grow to 4 1/2 feet long and weigh 25 to 90 pounds. They have dark, thick fur and large webbed hind feet that are good for working in the mud. Their 10- to 15-inch long flattened tail helps them swim and keeps them steady while cutting trees. Beavers sometimes use their flat tail to signal other beavers. When danger is near, they'll whack it against the water, making a loud "smack."

Beavers live along streams, rivers, marshes and lakes, and swimming is their specialty. Beavers can close their ears and nose for deep diving. In the water, a beaver propels itself with its webbed feet and flat tail. They have large lungs, too. They can hold their breath long enough to allow them to stay underwater for up to 15 minutes.

A beaver, like other rodents, uses its two big front teeth for gnawing. They eat mostly trees and bark, so the teeth are worn down constantly and grow their entire lives. Along the Missouri River, they eat mostly cottonwood and willow trees. Beavers are primarily nocturnal. They work the night shift! To prepare for winter, beavers store tree branches in deep pools.

Beavers live in large families. The young stay with their parents for two years. Kits are born in May with full fur coats and sharp teeth. They can even swim, but they usually don't come out of the lodge or den until they are about one month old.

Hind foot with webbed toes

The Back Page

with Oakley Nutkins

Q: Why do cats purr? Where does the sound come from?

Lindsey Douglas

A: Amazingly, nobody is really sure how cats are able to purr, or why. Experts believe they purr by directing air over a set of vestibular folds, or false vocal cords, in the larnyx. Many believe that cats purr to express satisfaction, but they actually seem to purr under a wide range of conditions, including illness and injury.

Q: Quite frequently we hear coyotes, and occasionally we see them. How many young does a coyote raise per year? What does a coyote's diet contain?

Josephine Girod, 13

A: Like dogs, coyotes can have just a few or lots of pups. Litter size usually ranges between two and 11 pups. In Missouri, most coyote pups are born from mid April to early May. Pups are born blind and helpless, but after about three weeks they are able to exit the den. By fall, they are independent. Coyotes often eat rats, mice and rabbits, but they're opportunists and consume whatever food they can find. They'll eat grasshoppers, beetles, fruits and berries. Sometimes they raid garbage cans, pet food bowls or corn fields.

Jim Rathert

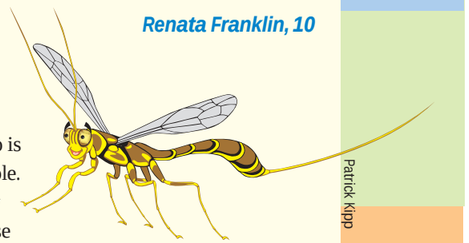
Coyotes eat almost anything.

Jim Rathert

Bobcats purr just like house cats.

Q: Does the Ichneumon wasp sting people?

Renata Franklin, 10



Patrick Kipp

A: Despite its fierce appearance, the Ichneumon wasp is harmless to people. In fact, it's highly beneficial because it preys on the larvae of destructive insects such as clinch bugs, boll weevils, codling moths and asparagus beetles.

Q: Can I subscribe to *Outside In*? I have a collection of them given to me by my teacher, but I would like them to be delivered to my house.

Jeremy Smith

A: *Outside In* is published four times a year. It isn't mailed out separately, except to teachers for use in classrooms. Instead, *Outside In* is included inside the February, May, August and November issues of the *Conservationist* magazine. If your family receives the *Conservationist*, you are already receiving all the issues of *Outside In*. You can even pull this special section free from the rest of the magazine.

Kids: have a question?
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Cover: illustration by Michael Haynes